183.39735PA6

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: B. TOWNSEND, et al.

Serial No: 10/814,260

Filed: April 1, 2004

Title: PROSTHETIC FOOT WITH TUNABLE PERFORMANCE

Group: 3774

Examiner: Javier G. Blanco
Conf. No.: 6963

SUBSTANCE OF INTERVIEW

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

July 15, 2009

Sir:

Notice of Allowance with Examiner's Amendment was mailed in the above-identified application on June 17, 2009. An Interview Summary, PTOL-413, summarizing the results of a May 19, 2009 telephone interview between Examiner Javier Blanco and Applicant's undersigned attorney was included with the Notice of Allowance. This is to confirm the substance of the interview summarized in the Interview Summary, Form PTOL-413. Additionally, it is noted that the May 19, 2009 telephone interview was preceded by a May 15, 2009 e-mail from Examiner Javier Blanco to the undersigned proposing amendments to independent claims 1 and 40 to put the case in condition for allowance. A copy of the May 15, 2009 e-mail is attached hereto as Exhibit 1.

The May 19, 2009 telephone discussion between Examiner Blanco and the undersigned discussed revisions to the proposed claims. The revised

claims as agreed to during the May 19, 2009 telephone interview were forwarded by the undersigned in a May 20, 2009 e-mail to Examiner Javier Blanco. A copy of the May 20, 2009 e-mail is enclosed herewith as Exhibit 2.

During the May 19, 2009 telephone interview and a May 21, 2009 telephone call the patentablity of the claims as amended over the references relied upon in the outstanding rejections of the claims was discussed. In particular, reasons for patentability were advanced over each of the references along the lines of the arguments presented in the remarks in Applicant's Amendment filed September 11, 2008. The Examiner agreed during the telephone interviews that the amended claims patentably define, 35 U.S.C. § 102 and 103, over the cited references.

Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 01-2135 (Case No. 183.39735PA6) and please credit any excess fees to such deposit account.

Respectfully submitted,

/Ronald J. Shore/

Ronald J. Shore
Registration No. 28,577
ANTONELLI, TERRY, STOUT & KRAUS, LLP

RJS/kmh

Attachments: Exhibits 1 and 2

EXHIBIT 1

Ronald Shore

From: Blanco, Javier (AU3774) [Javier.Blanco@USPTO.GOV]
Sent: Friday, May 15, 2009 3:01 PM
To: Ronald Shore
Subject: Application Number 10/814,260 - Attorney Docket Number: 183.39735AP6
Importance: High

Good afternoon Attorney Shore,

Below is my proposed Examiner's Amendment for Application Number **10/814,260** - Attorney Docket Number: **183.39735AP6**. The applied Prior Art of record is really, really close to the language of the claims. Further, the method claims lacked any structural limitation describing the "device" or the "assisting". Hence the proposed Examiner's Amendment (below) to put the case in condition of allowance.

Since I am taking a short vacation by the end of next week, I will need a response by Wednesday (5/13/2009) afternoon at the latest.

Have a great weekend, and my regards to Mr. Townsend!

Javier

Claim 1 (Currently Amended) A method of generating kinetic power for propulsive force in a lower extremity prosthesis including a longitudinally extending foot keel, an ankle and an elongated, upstanding shank above the ankle for connection with a lower extremity prosthetic socket on a person's leg stump, the method comprising:

providing (~~a~~) an upstanding monolithically formed resilient member which forms the ankle and the shank in the prosthesis with a lower end of the resilient member terminating posteriorly and connected to the foot keel, the lower end of the resilient member anteriorly extending upwardly by way of an anterior facing convexly curved surface to form the ankle, the resilient member extending upwardly in a substantially curvilinear manner substantially above human ankle joint height and the ankle to form the shank and defining a lower prosthetic part of a leg, wherein the resilient member is curved longitudinally over at least substantially the entire height of the member above the foot, and wherein the shank has an upper end which during use of the lower extremity prosthesis is moved longitudinally with respect to the foot keel during force loading and unloading of the lower extremity prosthesis; and

changing the ankle torque ratio of the lower extremity prosthesis in gait by using a posterior calf device on the lower extremity prosthesis to effect a change in the sagittal plane flexure characteristic for longitudinal movement of the upper end of the resilient member in response to force loading and unloading during a person's use of the lower extremity

prosthesis, the ankle torque ratio being defined as the quotient of the peak dorsiflexion ankle torque in the late terminal stance phase of gait divided by the plantar flexion ankle torque created in the lower extremity prosthesis in the initial foot flat loading response after heel strike in gait, wherein said posterior calf device (~~assisting~~) assists posterior movement of the upper end of the resilient member and (~~controlling~~) controls anterior movement of the upper end of the resilient member during use of the prosthesis, and wherein the posterior calf device is located posterior of the resilient member and includes at least one flexible strap connecting the upper end of the resilient member and the lower portion o the lower extremity prosthesis, and at least one spring which is resiliently biased by the at least one strap in response to anterior movement of the upper end of the resilient member for storing energy.

Claim 40 (Currently Amended) A method of generating power for propulsive force in a prosthetic foot comprising:

providing a prosthetic foot having a longitudinally extending foot keel and a monolithically formed resilient calf shank forming an ankle and an elongated, upstanding shank above the ankle for connection with a lower extremity prosthetic socket on a person's leg stump, the calf shank having a lower end terminating posteriorly and connected to the foot keel, the lower end of the calf shank anteriorly extending upwardly by way of an anterior facing convexly curved surface to form the ankle, the resilient calf shank extending upwardly in a substantially curvilinear manner substantially above human ankle joint height and the ankle to form the lower prosthetic part of a leg, wherein the resilient calf shank is curved longitudinally over at least substantially the entire height of the calf shank above the foot keel and has an upper end which during use of the prosthetic foot is moved longitudinally with respect to the foot keel during force loading and unloading of the prosthetic foot; and

changing the ankle torque ratio of the prosthetic foot in gait by using a posterior calf device on the prosthetic foot to effect a change in the sagittal plane flexure characteristic for longitudinal movement of the upper end of the calf shank in response to force loading and unloading during a person's use of the prosthetic foot, the ankle torque ratio being defined as the quotient of the peak dorsiflexion ankle torque in the late terminal stance phase of gait divided by the plantar flexion ankle torque created in the prosthetic foot in the initial foot flat loading response after heel strike in gait, wherein the posterior calf device is located posterior of the calf shank and includes at least one flexible strap connecting the upper end of the calf shank and the lower portion of the prosthetic foot, and at least one spring which is resiliently biased by the at least one strap in response to anterior movement of the upper end of the calf shank for storing energy.

EXHIBIT 2

Ronald Shore

From: Ronald Shore
Sent: Wednesday, May 20, 2009 3:37 PM
To: 'Javier.Blanco@USPTO.GOV'
Subject: FW: 183.39735PA6 - USSN 10/814,260 - Barry Townsend et al
Attachments: I97338.DOC

Dear Mr. Blanco,

Attached please find the revised claims per our telephone discussion on May 19, 2009 and in reference to your e-mail of May 15, 2009 with suggested amendments to the claims. With the changes in the attached claims it is believed the claims are patentable, 35 U.S.C. 102 and 103, over the cited prior art. Please call if there remain outstanding issues. Thanks.

Very truly yours,
Ron Shore
Reg. No. 28,577

From: Donna Heise
Sent: Wednesday, May 20, 2009 3:23 PM
To: Ronald Shore
Subject: FW: 183.39735PA6 - USSN 10/814,260 - Barry Townsend et al

Attached is the revised version with your one word change.

Donna L. Heise, Secretary to Donald E. Stout
Antonelli, Terry, Stout & Kraus, LLP
1300 North Seventeenth Street, Suite 1800
Arlington, Virginia 22209
PH: (703) 312-6649
FAX: (703) 312-6600
email: dheise@antonelli.com

From: Donna Heise
Sent: Wednesday, May 20, 2009 2:37 PM
To: Ronald Shore
Subject: 183.39735PA6 - USSN 10/814,260 - Barry Townsend et al

Attached are the proposed revised claims.

Donna L. Heise, Secretary to Donald E. Stout
Antonelli, Terry, Stout & Kraus, LLP
1300 North Seventeenth Street, Suite 1800
Arlington, Virginia 22209
PH: (703) 312-6649
FAX: (703) 312-6600
email: dheise@antonelli.com

Proposed Claims to Examiner:

Amendments to the Claims

The following listing of claims replaces all prior listings, and all prior versions, of claims in the application.

Listing of Claims

1. (currently amended) A method of generating kinetic power for propulsive force in a lower extremity prosthesis including a longitudinally extending foot keel, an ankle and an elongated, upstanding shank above the ankle for connection with a lower extremity prosthetic socket on a person's leg stump, the method comprising:

providing an upstanding monolithically formed resilient member which forms the ankle and the shank in the prosthesis with a lower end of the resilient member terminating posteriorly and connected to the foot keel, the lower end of the resilient member anteriorly extending upwardly by way of an anterior facing convexly curved surface to form the ankle, the resilient member extending upwardly in a substantially curvilinear manner substantially above human ankle joint height and the ankle to form the shank and defining a lower prosthetic part of a leg, wherein the resilient member is curved longitudinally over at least substantially the entire height of the member above the foot keel, and wherein the shank has an upper end which during use of the lower extremity prosthesis is

moved longitudinally with respect to the foot keel during force loading and unloading of the lower extremity prosthesis; and

changing the ankle torque ratio of the lower extremity prosthesis in gait by using a posterior calf device on the lower extremity prosthesis to effect a change in the sagittal plane flexure characteristic for longitudinal movement of the upper end of the resilient member in response to force loading and unloading during a person's use of the lower extremity prosthesis, the ankle torque ratio being defined as the quotient of the peak dorsiflexion ankle torque in the late terminal stance phase of gait divided by the plantar flexion ankle torque created in the lower extremity prosthesis in the initial foot flat loading response after heel strike in gate, wherein said posterior calf device assists posterior movement of the upper end of the resilient member and controls anterior movement of the upper end of the resilient member during use of the prosthesis and wherein the posterior calf device is located posterior of the resilient member and includes at least one strap connecting the upper end of the resilient member and the lower portion of the lower extremity prosthesis, and at least one spring which is resiliently biased by the at least one strap in response to anterior movement of the upper end of the resilient member for storing energy.

Deleted: assisting

Deleted: controlling

2. (currently amended) The method according to claim 1, wherein said assisting posterior movement includes resiliently biasing the upper end of the resilient member for posterior movement using the device provided on the prosthesis.

Deleted: a

3. (currently amended) The method according to claim 1, wherein said controlling anterior movement limits the range of anterior movement of the upper end of the resilient member using the device provided on the prosthesis.

Deleted: a

4. (currently amended) The method according to claim 1, wherein said controlling the anterior movement includes resisting the anterior movement of the upper end of the resilient member using the device provided on the prosthesis.

Deleted: a

5. (currently amended) The method according to claim 1, wherein said controlling the anterior movement includes resiliently biasing the at least one spring of the device on the prosthesis during anterior movement of the upper end of the resilient member to store energy in the device with force loading of the prosthesis in gait, the device returning the stored energy during force unloading of the prosthesis adding to the propulsion of the person's body in gait.

Deleted: a

6. (currently amended) The method according to claim 1, wherein said assisting and said controlling increase the ankle torque ratio of the prosthesis in gait.

Deleted: , the ankle torque ratio being defined as the quotient of the peak dorsiflexion ankle torque that occurs in the prosthesis in the late terminal stance of gait divided by the plantar flexion ankle torque created in the prosthesis in the initial foot flat loading response after heel strike in gait

7. (original) The method according to claim 6, including increasing the ankle torque ratio to mimic the ankle toque ratio which occurs in a human foot in gait.

8. (original) The method according to claim 6, including increasing the ankle torque ratio so that said peak dorsiflexion ankle torque is an order of magnitude greater than said plantar flexion ankle torque.

9. (original) The method according to claim 6, including increasing the ankle torque ratio to a value of about 11 to 1.

10. (original) The method according to claim 1, including providing the foot with a high low dynamic response capability.

11. (currently amended) The method according to claim 10, including providing said foot keel with high low dynamic response capability including forming a midfoot portion of the foot keel with a longitudinal arch with a medial aspect larger in radius and with a relatively higher dynamic response capability than a lateral aspect of the arch.

Deleted: wherein said foot includes a foot keel and said

Deleted: the

Deleted: includes

12-39. (cancelled)

40. (currently amended) A method of generating power for propulsive force in a prosthetic foot comprising:

providing a prosthetic foot having a longitudinally extending foot keel and a monolithically formed resilient calf shank forming an ankle and an elongated, upstanding shank above the ankle for connection with a lower extremity prosthetic socket on a person's leg stump, the calf shank having a lower end terminating posteriorly and connected to the foot keel, the lower end of the calf shank anteriorly extending upwardly by way of an anterior facing convexly curved surface to form the ankle, the resilient calf shank extending upwardly in a substantially curvilinear manner substantially above human ankle joint height and the ankle to form the lower prosthetic part of a leg, wherein the resilient calf shank is curved longitudinally over at least substantially the entire height of the calf shank above the foot keel and has an upper end which during use of the prosthetic foot is moved longitudinally with respect to the foot keel during force loading and unloading of the prosthetic foot; and

changing the ankle torque ratio of the prosthetic foot in gait by using a posterior calf device located on the prosthetic foot posterior of the calf shank and connecting the upper end of the calf shank and a lower portion of the prosthetic foot to effect a change in the sagittal plane flexure characteristic for longitudinal movement of the upper end of the calf shank in at least the anterior direction in response to force loading and unloading during a person's use of the prosthetic foot, the ankle torque ratio being defined as the quotient of the peak dorsiflexion ankle torque in the late terminal stance phase of gait divided by the plantar

flexion ankle torque created in the prosthetic foot in the initial foot flat loading response after heel strike in gait.

41. (original) The method according to claim 40, wherein the ankle torque ratio is changed to mimic that of a human foot.

42. (original) A method according to claim 40, wherein the ankle torque ratio is changed so that the peak dorsiflexion ankle torque that occurs in the late terminal stance of gait is at least an order of magnitude greater than the plantar flexion ankle torque created in the initial foot flat loading response after heel strike in gait.

43. (original) The method according to claim 40, wherein the ankle torque ratio is changed to about 11 to 1.

44. (original) The method according to claim 40, wherein the ankle torque ratio is changed by using the posterior calf device to at least one of assist the posterior movement of the upper end of the calf shank and limit the anterior movement of the upper end of the calf shank.

45. (original) The method according to claim 44, wherein the posterior calf device assists the posterior movement of the upper end of the calf shank by resiliently biasing the upper end for posterior movement.

46. (original) The method according to claim 44, wherein the posterior calf device limits the anterior movement of the upper end of the calf shank by resiliently biasing at least one member of the posterior calf device during anterior movement of the upper end of the calf shank with force loading of the prosthetic foot to store energy for return during force unloading of the prosthetic foot.

47. (withdrawn) The method according to claim 40, including monolithically forming the foot keel, calf shank and posterior calf device.

48. (withdrawn) The method according to claim 40, including providing the foot keel with a resilient longitudinal arch which can be expanded in gait during force loading of the prosthetic foot for storing energy that is returned during force unloading.

49. (withdrawn) The method according to claim 48, including forming the medial aspect of the longitudinal arch with a larger radius than the lateral aspect.